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III. *An Account of Morne Garou, a Mountain in the Island of St. Vincent, with a Description of the Volcano on its Summit. In a Letter from Mr. James Anderson, Surgeon, to Mr. Forsyth, His Majesty's Gardener at Kensington; communicated by the Right Honourable Sir George Yonge, Bart. F. R. S.*

Read November 18, 1784.

THE many ridges of mountains which intersect this island in all directions, and rise in gradations, one above the other, to a very great height, with the rivers tumbling from their sides over very high precipices, render it exceeding difficult to explore its interior parts.

The most remarkable of these mountains is one that terminates the N.W. end of the island, and the highest in it, and has always been mentioned to have had volcanic eruptions from it. The traditions of the oldest inhabitants in the island, and the ravins at its bottom, seem to me to vindicate the assertion. As I was determined, during my stay in the island, to see as much of it as I could; and as I knew, from the altitude of this mountain, there was a probability of meeting with plants on it I could find in no other part of the island; I should have attempted going up if I had heard nothing of a volcano being on it. But viewing the mountain at a distance, the structure of it was different from any in the island, or any I had seen in the West Indies. I could perceive it divided into many

different ridges, separated by very deep chasms, and its summit appeared quite destitute of any vegetable production. On examining several ravins, that run from the bottom a great way up the mountain, I perceived they were quite destitute of water, and found pieces of pumice-stone, charcoal, several earths and minerals, that plainly indicated there must be some very singular place or other on some part of the mountain. I also recollect a story told by some very old men in the island, that they had heard the captain of a ship say, that between this island and St. Lucia he saw, towards night, flames and smoke issuing from the top of this mountain, and next morning his decks were covered with ashes and small stones. This, you may readily imagine, was excitement enough to examine it, if I possibly could; but I was much discouraged upon being told, it was impossible to gain the summit of it; nor could I get either white men, Carribbee, or Negro, that would undertake to conduct me up for any reward I could offer; nor could I get any information relative to it. But as difficulty to attain enhances the value of the object, so the more I was told of the impossibility of going up, the more was I determined to attempt it.

After I had examined the basis of it, as far as I could for the sea and other mountains, to find the most probable place to commence my journey, I observed an opening of several large and dry ravins, that seemingly ran a great way up; but I was not sure if they were not intersected by some rocks or precipices I could not get over. I came to Mr. MALOUNE's, about a mile distant from the mountain, but the highest house to it I could stay at all night. Here I met with a friendly reception and great hospitality. After communicating my intentions to him, he told me, he would give me every assistance

he could, by sending some trusty negroes with me, and wished he was able to go with me himself. This was a kind offer to me, in my then situation, as negroes were what I only wanted, having only one boy belonging to Dr. YOUNG with me. I knew, if I had great difficulties in the woods, he and I both should be inadequate to the task, as in a short time we should be so wearied as to be unable to proceed: from what I had seen of the mountain, I knew I must be under the necessity of carrying water with me; and from the great distance to the top, and obstructions we might naturally expect, I should at least require two days to accomplish it.

By examining the side of the mountain towards me with a good glafs, I imagined I saw two ridges I might get up. I perceived they were covered great part of the way with thick wood; yet I hoped, with a little cutting, I should be able to scramble through them. I appointed next morning to begin my route by one of these ridges.

February 26, 1784, I left Mr. MALOUNCE's about sun-rise, with two stout negroes and Dr. YOUNG's boy; each of us having a good cutlafs, as well to clear our way through the woods, as to defend us in case we should be attacked by Caribbees or run-away negroes. We arrived at the bottom of the mountain a little before seven in the morning. To get to either of the ridges, we found we had a rock to climb above forty feet high: it was with great difficulty we scrambled up, assisting one another in the best manner we could; here we found it necessary to contract our baggage. After getting up this rock, I found myself in the bottom of a narrow and deep ravin. Having ascended this ravin a little way, I saw some cleared ground on its sides, with tobacco growing. This I conjectured was the habitation of some Caribbees; but I was much surprised

surprised when one of the negroes I had with me told me, it was the habitation of a Mr. GASCO, a Frenchman. What could induce a stout healthy man in the prime of life, and a good mechanick, with several negroes, to take up his residence among rocks and precipices, excluded from the whole world, is a mystery to me. Besides, by every torrent of rain that happens, he may expect himself and all his habitation to be washed over the rocks into the ocean. Notwithstanding his singular situation, I found him an intelligent man, and I experienced every hospitality his poor cottage could afford.

The difficulty of going through woods in the West Indies, where there are no roads or paths, is far beyond any thing an European can conceive. Besides tall trees and thick under-wood, there are hundreds of different climbing plants twisted together like ropes, and running in all directions to a great extent, and even to the tops of the highest trees ; by pushing on they cannot be broke, and many of them with difficulty cut ; besides a species of grafts, the *Schoenus Lithospermus*, with serrated leaves, that cuts and tears the hands and face terribly. With such obstructions as these it was above two hours before we got on the ridge, where I was in hopes our passage would have been easier ; but I soon found my mistake, for I was surrounded with a thick forest, much more difficult to get through than before, on account of the large piles of trees broken down by the hurricanes, to pass which in many parts we were obliged to creep on our hands and feet to get below them, and in other places to climb a great height above the surface of the ground, to get over large trunks lying on one another, and these being frequently rotten, occasioned us to tumble headlong down to a great depth, among rotten wood and grafts, so that it was with great difficulty I and the negroes could extricate ourselves. By

constantly cutting to clear our way, I, as well as my companions, grew much fatigued, and they wished much to return back. About four in the afternoon I could not prevail upon them to proceed farther; if they did, they could not return before dark, and they would not sleep all night in the woods; but said, if I stayed they would return to me next morning. I saw it was impossible to gain the summit of the mountain with the boy only by that route: I likewise saw the woods growing more difficult, my water also totally expended: from these considerations I intended to go down to the Frenchman's, and remain there all night, and try another route with my boy next morning, hoping I might be fortunate enough to find an easier passage. I arrived at Mr. Gasco's a little after sun-set, being much fatigued and thirsty, and never experienced more hospitality and kindness than from this man in his miserable cot; for we ought not to judge of the value of the things received, but of the disposition of the heart with which they are given. He parted with his hammock to me, and slept on a board himself. This I at first refused; but he insisted on it, telling me, from my hardships of the day I was much more tired than he. I took the hammock, but I found it was impossible to close my eyes during the night with cold. His hut was built of *roseaux* or large reeds, between each of which a dog might creep through, and the top was covered with dry grass. It is situated in the bottom of a deep gully, where the sun does not shine till nine in the morning, nor after four in the afternoon. It is surrounded by thick wood, and during the night the whole of the mountain is covered with thick clouds, from which it frequently rains; this makes the night air exceedingly cold. I got ready to renew my journey next morning, having only Dr. Young's boy with me, who continued

very faithful to me during this excursion, being very active and hardy: I do not know if I could have gone through this fatigue had it not been for his assistance. I now determined to commence this day's route up the ravin, as it seemed to widen and apparently run a considerable way up in the direction I wished for; and if I could get out of it upon the other ridge, it would at least be two miles nearer than the way I had attempted yesterday, and probably, after getting out of it, I might find wood easier of access. In this ravin I got up about a mile and a half, without meeting with any considerable obstruction. Encouraged by getting so far, although the ravin was narrowing fast, with numbers of rocks and precipices to climb over, with vines and bushes difficult to get through, I was resolved to persist in this route, and determined by every possible means to get to the object of my wishes, well knowing if I could not perform it this way, I might abandon it entirely. After climbing over a number of difficult passes, the ravin terminated at the bottom of a very high precipice; how far it was to the summit I did not know, being covered toward the top with thick wood; but from the bottom upwards it was loose sand as far as I could see, with ferns and tufts of grass, which, as soon as I took hold of them, came out at the roots. The precipice being so very steep, with no trees or bushes on it to assist me in getting up, I plainly saw the attempting to climb it was at the risk of my life: however, I was resolved to try it, and telling the boy to keep some distance behind me, in case I should tumble and drive him down along with me, I began to ascend, holding the tufts of grass as lightly as possible, and digging holes with my cutlass to put my feet in; but I often lost my hold, and frequently slipped down a considerable distance: however, as it was nothing but loose

loose sand, I could easily push my cutlass into it to the handle, and by grasping it could recover myself again. Had I not taken the resolution before I began to ascend to divest myself of fear, I could not possibly have gone, for the terror of falling would have been the means of it every instant. I got up to some wild plantains, which I saw continued all the way to the place where the bushes and trees began to grow. I here rested myself, and waited for the boy's getting to me, which he did much easier than I, although he had the provisions and water, owing to the track I had made, and because, being much lighter, he could better trust himself to the grass and ferns. After some labour we arrived at the top of the precipice. I found myself on a very narrow ridge, thickly covered with wood, and bounded by two ravins, the bottoms of which I could not see; the descent to them seemed to be nearly perpendicular, yet all the way covered with thick wood. After refreshing ourselves, we began our fatigue, the boy and I cutting, and carrying our water and provisions, alternately. When we had got some way, I found I was on an exceeding narrow ridge, in many parts not six feet broad; on each side a tremendous gulf, into one or other of which I was often in danger of falling, so that with great caution I was obliged to lie down on my belly, to see through the bushes how the ridge tended. Here I began to smell sulphur, or rather a smell like gunpowder. As I knew this smell must come from the top of the mountain, being in the direction of the wind, I was in hopes we could not be far from it, as the smell grew stronger and stronger as I ascended. I saw a rising before me, and thought if I was once on it, if the top of the mountain was near I could have a view of it; but having got on this rising I could only see a high peak on the N.W. end of the mountain, and by appearance I thought

myself very little nearer than when I was at the bottom. The woods now became very difficult to get through; great quantities of fallen trees lying buried under long grass and being rotten, when I thought myself walking on the ground, I was frequently buried a great depth among them. Being now about noon, and my turn to carry the baggage, and consequently my turn of rest, I was surprised to hear a rustling among the bushes, and something like a human voice behind me. As we were now in a place where I had little reason to suppose there had been a human foot before, and could not imagine there could be habitations of Caribbees or run-away negroes, since from the barrenness of the mountain they could not possibly find any provisions to subsist on, I told the boy to stand still, and let us wait their coming up; for if they were Caribbees advancing with an intention to hurt us, there was no alternative but to defend ourselves. You may imagine my surprise when I saw one of the negroes who had been with me the day before, with three others, which Mr. MALOUNE had sent to my assistance, with plenty of provisions. After refreshment, with this assistance, I renewed my labours with fresh spirits, and thought I was sure of reaching the top before night. Having proceeded a little, I had a fair view of the ravin on my left, which was of prodigious depth, and ran from near the top of the mountain to the sea; its bottom seemed to be a rock of a colour nearly resembling lava, and appeared as if there had been vast torrents of sulphureous matter running in it some time. I regretted much I knew not of this ravin before I commenced my excursion, as by passing a head-land in a canoe, and getting into the ravin, I might have gained the summit of the mountain, without experiencing the delays and difficulties I here encountered. It was now about

4 P.M. and I had no prospect of the mountain's top ; but from the ascent of the ravin below, I knew it was a great way off. I thought if I could get into the ravin before night, I could get easily up next morning. After cutting a great way through wild plantains, the sun near setting, I found myself almost over the verge of a precipice ; by catching hold of some shrubs I prevented myself from falling. We were now about half-way down ; but all the way below us, as far as we could see, was a perpendicular precipice of rock, several hundred feet high, to pass which was impossible. I had a view of some part of the top of the mountain, which I saw was yet far from me ; nor could I attempt any other way than the ridge I had left. Being now sun-set, and the negroes very discontented, because they could not return that night, I found we must take up our night's residence in the place where we were. It was a very unfavourable one, there being nothing but plantains growing, which retaining the rain long in their leaves, and being frequently agitated by the wind, were constantly dropping, and kept the ground always moist. Being almost dark, we had time to make us no other habitation, than placing two or three sticks against an old stump of a tree, and slightly covering them with plantain leaves. After getting together some little wood to make a fire to keep us comfortable, it began to blow and rain violently, which continued all night. We soon found our building afforded us no shelter, and the wood would not burn, so that we could not get any fire ; and the ground on which we were situated would not allow the least exercise to keep us warm. From such a miserable night I experienced no mitigation for the fatigues of the day. I wished for the rising sun, to renew my labours ; which I at last beheld with inexpressible joy.

As soon as we could see, we returned to the ridge we left the night before, and began to work with alacrity, as we were almost chilled with cold. I pushed on as fast as possible, and about ten o'clock found the woods began to grow thin. I could not see the top of the mountain, but had a view of several ridges that joined it. From the wind falling, and the heat growing intense, I thought we must then be under the cover of the summit: I here found many new plants. About eleven A.M. I was overjoyed to have a full view of the summit of the mountain, nearly a mile distant from us, and that we were nearly out of the woody region. The top seemed to be composed of six or seven different ridges, very much broken in the sides, as if they had suffered great convulsions of nature; they were divided by amazing deep ravins, without any water in them. I observed where the ridges meet the edge of a large excavation, as it seemed to be, on the highest part. I imagined this might be the mouth of the crater, and directed my course to a high peak which overlooked it. I found here a most beautiful tree which composed the last wood. After that I entered into a thick long grafts, intermixed with fern, which branched and ran in every direction. To break it was impossible, and with great difficulty I could cut it; so that in clearing our way through this grafts, eight or ten feet high, there was equal difficulty as in the woods, and it seemed to continue very near to the top of the mountain. Being now about noon, I and the negroes were so fatigued as hardly to be able to stand; our thirst very great, to allay which, as much as possible, we chewed the leaves of the Begonia obliqua. Two of the negroes returned, and the others said they would go no farther with me, as they must perish for want of water, and it would be impossible to get to the bottom before night, and they must all die.

die in the woods. The propriety of their reasoning was evident to me ; yet I thought it hard, after the fatigues of three days and two nights, to be within half a mile of the top, and not be able to get up, and to know little more about it than I did at the bottom. As the negroes had not the same motive for going up as I, all my reasoning was to them ineffectual ; I found I was obliged to return myself, as I could not persist alone. At half past twelve we began to descend the same way we came. As there was now a clear path all the way to the bottom, we got down to Mr. GASCO's by sun-set. After sitting some time here, I was hardly able to rise again, I was so tired ; and my feet were so sore I could hardly stand on them, for, my shoes being torn to pieces, I came down the whole way bare-footed. I continued my journey, however, to Mr. MA-LOUNE's, where I arrived between six and seven at night.

March 4th, being the day I had fixed to finish my excursion, about four in the morning, I left the house of Mr. FRASER, who out of curiosity agreed to accompany me, of which I was very glad, as he was a sensible young man ; and with the assistance of two negroes we pursued our journey. We found very little obstruction in our way up, until we got to the place where I returned ; and there, for about a quarter of a mile, we had considerable difficulty to clear our way through grass and ferns. After we came within a quarter of a mile from the top, we found ourselves in another climate all at once, the air very cold, and the vegetable productions changed ; here was nothing but barrenness over the whole summit of the mountain. On the confines of the grassy region and the barren I found some beautiful plants. Moss grows here in such plenty, that I frequently sunk up to my knees in it. This is the only place in the West Indies that produced any moss that I have seen. About noon

we gained the top of the peak I had directed my course to before ; when, in an instant, we were surprised with one of the grandest and most awful scenes I had ever beheld. I was struck with it amazingly, as I could not have conceived such a very large and so singularly formed an excavation. It is situated on the center of the mountain, and where the various ridges unite. Its diameter is something more than a mile, and its circumference to appearance a perfect circle. Its depth from the surrounding margin is above a quarter of a mile, and it narrows a little, but very regularly, to the bottom. Its sides are very smooth, and for the most part covered with short moss, except towards the south, where there are a number of small holes and rents. This is the only place where it is possible to go down to the bottom : it is exceedingly dangerous, owing to the numberless small chasms. On the west side is a section of red rock like granite, cut very smooth, and of the same declivity with the other parts. All the rest of the surrounding sides seems to be composed of sand, that looks to have undergone the action of intense fire. It has a crust quite smooth, of about an inch thick, and hard almost as rock ; after breaking through which, you find nothing but loose sand. In the center of the bottom is a burning mountain of about a mile in circumference, of a conic form, but quite level. On the summit, out of the center of the top, arises another mount, eight or ten feet high, a perfect cone ; from its apex issues a column of smoke. It is composed of large masses of red *granite-like* rock of various sizes and shapes, which appear to have been split into their present magnitudes by some terrible convulsion of nature, and are piled up very regular. From most parts of the mountain issue great quantities of smoke, especially on the north side, which appears to be burning from top to bottom,

and the heat is so intense, that it is impossible to go upon it. Going round the base is very dangerous, as large masses of rock are constantly splitting with the heat, and tumbling to the bottom. At the bottom, on the north side, is a very large rock split in two ; each of these halves, which are separated to a considerable distance from each other, is rent in all directions, and from the crevices issue efflorescences of a glossy appearance, which taste like vitriol, and also beautiful crystallizations of sulphur. On all parts of the mountain are great quantities of sulphur in all states; also alum, vitriol, and other minerals. From the external appearance of this mountain, I imagine it has only begun to burn lately, as on several parts of it I saw small shrubs and grass, which looked as if they had been lately scorched and burnt. There are several holes on the south, from which issues smoke, seemingly broken out lately, as the bushes round are but lately burnt. On two opposite sides of the burning mountain, east and west, reaching from its base to that of the side of the crater, are two lakes of water, about a stone's throw in breadth ; they appear to be deep in the middle ; their bottom to be covered with a clay-like substance. The water seems pleasant to the taste, and is of a chalybeate nature. I suppose these lakes receive great increase, if they are not entirely supported, by the rain that tumbles down the side of the crater. I observed on the north side of the bottom traces of beds of rivers, that to appearance run great quantities of water at times to both these lakes. By the stones at their edges, I could perceive that either absorption or evaporation, or perhaps both, go on fast. The greater part of the bottom of the crater, except the mountain and two lakes, is very level. On the south part are several shrubs and small trees. There are many stones in it that seem to be impregnated with minerals : I saw several pieces of pumice-

mice-stone. I also found many stones about the size of a man's fist, rough, on one side blue, which appearance, I imagine, they have got from heat, and being in contact with some mineral. These stones are scattered over the whole mountain, one or two of which I have sent you, with some others.

After I had got up from the bottom of the crater, I could not help viewing it with admiration, from its wonderful structure and regularity. Here I found an excavation cut through the mountain and rocks to an amazing depth, and with as much regularity and proportion of its constituent parts, as if it had been planned by the hand of the most skilful mathematician. I wished much to remain on the mountain all night, to examine its several ridges with more attention next day; but I could not prevail on my companion to stay, and therefore thought it advisable to accompany him.

I observed the motion of the clouds on this mountain to be very singular. Although there are several parts on it higher than the mouth of the crater, yet I saw their attraction was always to it. After entering on its east or windward side, they sunk a considerable way into it; then, mounting the opposite side, and whirling round the north-west side, they ran along a ridge, which tended nearly north-east, and afterwards sunk into a deep ravin, which divided this ridge from another on the north-west corner of the mountain, and the highest on it, lying in a direction nearly south and north. They keep the course of this ridge to the south end, and then whirl off west in their natural course.

I took my departure from the mountain with great reluctance. Although I encountered many difficulties to get up, yet it amply rewarded me for all my toil; but I had not time to examine it with that attention I wished. When I got on the peak

peak from which I had my first view of it, and from which I could see its different parts, I could not help reviewing it several times. After imprinting its structure on my mind, I took my final adieu of it, and returned down, and got to Mr. FRASER's house about seven at night, much fatigued.

I am sorry I had no instruments, to take the state of the air, nor the exact dimensions of the different parts of the mountain; but, I believe, on measurement, they will be more than I have mentioned.

From the situation of these islands to one another, and to the continent of South America, I imagine there are sub-marine communications between the burning mountains or volcanoes in each of them, and from them to the volcanoes on the high mountains of America. The islands, which are situated next the continent, seem to tend in the direction of those mountains; and I have observed, that the crater in this island lies nearly in a line with Soufriere in St. Lucia and Morne Pelée in Martinique, and I dare say from Morne Pelée to a place of the same kind in Dominique, and from it to the others; as it is certain there is something of this kind in each of these islands, Barbadoes and Tobago excepted, which are quite out of the range of the rest.

There is no doubt but eruptions or different changes in some of them, although at a great distance, may be communicated to and affect the others in various manners. It is observed by the inhabitants round these burning mountains, that shocks of earthquakes are frequent near them, and more sensibly felt than in other parts of the island, and the shocks always go in the direction of them.

I cannot omit mentioning the great assistance I received in the above excursion from Dr. YOUNG, Mr. MALOUINE, and Mr.

FRASER; for, without the aid of their negroes, I could not have possibly gone through with it.

## References to the figure, tab. II.

- A. 1. The summit that overlooks the crater, from which the drawing is taken.  
AAAA. The circumference of the crater.  
BBBB. The circumference of the bottom.  
C. The burning mountain.  
D. The small one on its summit.  
EE. The two lakes of water.  
F. The section of the rock on the west side of the crater.  
G. The large ravin.  
HHHH. Ravins of great depth.  
I. Efflorescence on the north end of the rock, which at a distance looks like alum or nitre.  
1.2.3.4.5.6. The different ridges on the summit of the mountain, as they join the crater.  
7. Woods destroyed by the hurricane.  
8.8. The clouds going to the southward of the west ridge, after passing north on the west side of the crater.  
9.9.9. Where I descended into the bottom of the crater.  
1 and 10. The summit and base of the ridge on which I ascended the mountain.



